impregnation used in the inventive process" Column 2, lines 20, 21). From this, it is clear that resin 22 is a part of the impregnated substrate and, as such, is: (a) not a discrete layer of dielectric material and (b) not free of glass fibers. If resin 22 was a discrete layer of dielectric material, it would be characterized as such and not characterized as part of the impregnated cloth. The thickness of resin 22 in Figures 2 and 3 greatly exaggerated. (See column 7, line 29 "These figures are not drawn to scale.").

There is a clear absence in the '800 reference of any description of applying resin 22 to an impregnated substrate as a step separate from impregnation of the substrate. Moreover, as stated in column 7, lines 21 and 22 of the '800 reference, "Figure 2 shows the impregnated cloth 20 composed of cloth 11 and resin 22" (emphasis added). In other words, in the '800 reference, resin 22 is part of the impregnated substrate, rather than a discrete layer that is applied to the substrate in a step separate from and after impregnation.

Also, it should be noted that representative thicknesses are given, at column 7, lines 29 through 31 of the '800 reference, for the copper and the cloth but none are given for the resin. This indicates that resin 22 is not regarded as anything but a part of the impregnated substrate.

Finally, Figures 3, 4 and 5 of this application should be compared with Figures 1, 2 and 3 of the '800 reference. In the '800 reference:

(a) "FIG. 1 shows a typical cloth before impregnation used in the inventive process." (Column 2, lines 20, 21)

(b) "FIG. 2 shows a typical impregnated cloth made in accordance with the inventive process" (Column 2, lines 22, 23)

(c) "FIG. 3 shows a typical copper cladded impregnated cloth made in accordance with the inventive process" (Column 2, lines 24, 25)

As shown in Figure 1 of the '800 reference, the glass fibers in substrate 11, before impregnation of the substrate, extend to the top and bottom surfaces of the substrate. Only after impregnation, as shown in Figure 2, do the glass fibers not extend to the top and bottom surfaces of the impregnated substrate. In Figures 3, 4 and 5 of Applicants' drawings, the glass fibers, represented by the wavy lines, do not extend to the top and bottom surfaces of the impregnated substrates 114, 160, 214, 260, 314 and 360. In other words, reference numerals 114, 160, 214, 260, 314 and 360 represent the same stage of formation of the impregnated substrate shown in Figure 2 of the '800 reference, namely a substrate composed of cloth 11 and resin 22.

As indicated at page 8, line 28 through page 9, line 2 of Applicants' specification:

> "Non-conductive layers 156, 158 insulate power planes 134, 152 from each other and from plated through hole 124 and from the glass fibers contained within substrates 114, 160. In this manner, shorts caused by electrochemical migration of conductive material between power planes 134, 152 and plated through hole 124 along glass fibers contained within substrates 114, 160, as described in connection with Figure 2, can be eliminated."

The arrangement disclosed in the '800 cannot provide such protection against shorts because the thin film or coating of resin formed at the surfaces of the substrate as the substrate is impregnated is inadequate to provide such protection. If one simply increased the build up of this resin film or coating by extending the impregnation to increase the thickness of the resin film or coating, serious handling problems during lamination (i.e. attaching a copper layer to the impregnated substrate) are created. During lamination, heat is applied to cause the resin to flow to enhance adhesion to the copper layer. It is readily apparent that excessive resin material flow, resulting from excessive build up of the resin during impregnation, is undesirable.

Applicants respectfully submit that claims 1 through 47 are patentable over the '800 reference.

Respectfully submitted,

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Dated: June 29, 1999

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